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10/576,976	07/17/2006	Takayuki Takahagi	127804	8155
25944 7590 06/04/2010 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
PARVINI, PEGAH				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

Application No.

10/576,976

Applicant(s)

TAKAHAGI ET AL.

Examiner

PEGAH PARVINI

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 7, 8 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 14-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

This Office Action is in reply to the amendment filed March 5, 2010. After entry of this amendment, claims 1, 3, 7-8 and 14-19 are currently pending in this application, with claims 7 and 8 being withdrawn from further examination.

There has been a typographical error in the Interview Summary sheet regarding the date of the interview; the interview which Applicants have, also, pointed out in their reply was in fact, conducted on February 18, 2010 and not on February 17.

Again, the Examiner acknowledges the error made and hereby wish to correct it.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3, and 14-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0040217 to Takashina et al. in view of U.S. Patent No. 6,337,060 to Hiraki et al. and in view of U.S. Patent No. 5,690,539 to Swidler et al., and further in view of "Safety data for pyridine".

Regarding claim 1, Takashina et al. disclose a polishing composition comprising of an aqueous medium, abrasive particles such as diamond, and additives such as water-soluble organic amines (Abstract; [0035], [0051]). The reference further discloses that the composition is suitable for forming a film for STI and subjecting an interlayer dielectric to planarization, thus, meeting the new limitation of film forming composition.

Takashina et al. do not disclose the treatment of diamond particles with a purifying agent. However, this would have been obvious to one of ordinary skill in the art to treat diamond particles with a purifying agent such as concentrated sulfuric acid as that taught by Hiraki et al. (column 3, lines 32-41; column 4, lines 66-68; column 5, lines 1-3 and 45-55) and heat the mixture motivated by the fact that this results in obtaining diamond particles which are not only functionalized and oxidized but also have lost at least less than one tenth of their impurities. The sulfuric acid causes metal impurities and graphite to be oxidized with  $\text{SO}_3$  to be dissolved as a sulfate and to form gaseous product (column 3, lines 49-54). In view of this, it is taken that the use of pure diamond would preclude the inclusion of impurities in the polishing composition of Yoshida et al., thus, minimizing the contamination of the substrate it is used upon (i.e. surface grinding of a substrate as is apparent from the specification in section [0032]).

Nevertheless, it should be noted that heating with a purifying agent is considered a process limitation in a product claim; thus, said recitation/limitation do not add patentable weight to the examination of the product claim.

Takashina et al. do not expressly and/or literally disclose a boiling temperature for their water soluble organic amine compound.

Nevertheless, although Takashina et al. do not expressly and/or literally disclose the boiling point for their water soluble amines, it would have been obvious to a person of ordinary skill in the art to have a water soluble amine having a boiling point within the recited range. This is motivated by the fact that the disclosure of Takashina et al. on the use of water soluble amine reads on any and all water soluble amine such as pyridine which has been known to those skilled in the art to be used in abrasive compositions for pH adjustment as that clearly shown by Swidler et al. in column 2, lines 45-55. Swidler et al., in fact, disclose that amine bases are used as pH adjuster, and among them, the reference give an example of pyridine. As for the boiling point, pyridine has been known to have a boiling point of about 115C as that shown by the "Safety data for pyridine" (attached to previous Office action).

Thus, it has been made obvious to have utilized an amine having a boiling point of a value which is within the claimed range as recited in instant claims.

Regarding claim 3, the combination of references, in particular, Takashina et al. disclose the use of an aqueous medium (Abstract of Takashina et al.).

Regarding claim 14, the combination of references makes it obvious to utilize an acid such as sulfuric acid as a purifying agent for diamond as detailed out above (see above).

Regarding claim 15, the combination of references makes it obvious to utilize pyridine as the amine (see above).

Regarding claim 16, although the combination of references as applied above for claim 1 may not expressly disclose that the diamond particles have a purity of at least "95% or higher", said combination discloses a composition comprising water (i.e. dispersant), an amine compound such as pyridine having a boiling point within the claimed range, and diamond fine particles which is made obvious to be purified and oxidized by concentrated sulfuric acid (i.e. purifying agent); therefore, the purity level of diamond particles is expected to follow from the purified and oxidized diamond particles of the combination of references absence clear and specific evidence showing the contrary.

Regarding claim 17, although the combination of references may not literally teach a size of 1-50 nm for the "raw" diamond particles, the combination of references and specifically, Hiraki et al. clearly disclose that an appreciable increase in suspension stability is obtained with fine particles having a size of less than 1 micron and a longer suspension holding time is obtained with fine particles of the size of *200nm or less* (column 3, lines 1-13). Furthermore, Takashina et al. clearly disclose diamond particles of the size of 2-200 nm for, most preferably, 100% by volume of the particles ([0038]). Therefore, one of ordinary skill in the art would have appreciated to have a fine particle size, such as what is claimed, for the raw diamond particles, in the teaching of

Takashina et al. motivated by the fact that (1) the diamond particles of Takashina et al. have 2-200nm particle size for diamond particles in use, and thus, the raw diamond particles are expected to have sizes within this range, and (2) Hiraki et al. clearly make it obvious that particles of the size of less than 1 micron contribute an increase in suspension stability and the ones having a size of less than 200 nm contribute a longer suspension holding time.

With reference to overlapping ranges, it is to be noted that overlapping ranges have been held to establish *prima facie* obviousness. MPEP § 2144.05.

**Claims 18-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Takashina et al. in view of Swidler et al. in view of "Safety date for pyridine" as applied to claims 1 and 15 above, and further in view of U.S. Patent No. 6,143,794 to Chaudhuri et al.

The combination of Takashina et al., Swidler et al., and "Safety date for pyridine" disclose a composition comprising the claimed component and cable of forming a film as detailed out above.

Takashina et al. clearly disclose the use of water soluble amine compounds for pH adjustment; although said reference or the combination of references does not expressly and/or literally disclose that said water soluble amine compound may be one such as diethanolamine, it would have been obvious to consider diethanolamine as one of the suitable amines used to adjust the pH, and it would have been obvious to a person of ordinary skill in the art to modify the combination of reference to have used

diethanolamine for that purpose motivated by the fact that diethanolamine and amines such as pyridine or triethanolamine are functionally equivalent, in at least, changing/adjusting the pH as that shown by Chaudhuri et al. (column 8, lines 30-37) which clearly disclose the use of amine bases such as triethanolamine, diethanolamine and other basic compound for pH adjustment. It should be noted that not only Takashina et al. clearly disclose the use of water soluble amine, but that Swidler et al. clearly show that amines such as pyridine, triethanolamine, and sodium hydroxide (all considered to be water soluble) are well known in the art to be used as pH adjuster (Swidler et al. column 2, lines 45-55). Considering these facts and based on the teachings of Chaudhuri et al. on showing diethanolamine, triethanolamine, sodium hydroxide as well as other basic compounds used for pH adjustment, it is well within the scope of one of ordinary skilled in the art to have used a water soluble amine such as diethanolamine in the place of "water soluble organic amines" of Takashina et al. to obtain the invention as claimed.

With reference to boiling point, it should be noted that diethanolamine is known to have a boiling point within the claimed range as that has been clearly evidenced from its MSDS sheet (attached).

### ***Response to Arguments***

Applicants' arguments with respect to claims 1, 3, and 14-19 have been considered but are moot in view of the new ground(s) of rejection.



***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/  
Examiner, Art Unit 1793

/Anthony J Green/  
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